

ATTORNEY'S DOCKET NUMBER

HHI-035US

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C.371**

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/019839

INTERNATIONAL APPLICATION

PCT/DE00/02256

INTERNATIONAL FILING DATE

04 July 2000 (04.07.00)

PRIORITY DATE CLAIMED

07 July 1999 (07.07.99)

TITLE OF INVENTION

BEHIND THE EAR HEARING AID WITH FRONT PLATE (as amended)

APPLICANT(S) FOR DO/EO/US

Hans-Dieter BOROWSKY

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).
4. ☐ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)) (**5 sheets**).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has **NOT** expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (**unexecuted**) (**3 Sheets**);
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98 **(2 sheets) with Form PTO-1449 (1 sheet) and 2 cited references (3 sheets);**
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included
13. ☒ A FIRST preliminary amendment **(4 sheets) (along with version of markings to show changes (2 sheets));**
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.

16. ☒ Other items or information: Transmittal Letter (2 sheets in duplicate); International Published Application W/O 01/05190 A2 (without International Search Report) (9 sheets); International Search Report (3 sheets); International Preliminary Examination Report (6 sheets); Check in the amount of \$495 (Filing Fee) based on small entity; Certificate of First Class Mailing (1 sheet); and Return Postcard.

Form PTO-1390 (REV 10-2000) page 2 of 2

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JG13 Rec'd PCT/PTO 02 JAN 2002

**IN THE UNITED STATES PATENT DESIGNATED OFFICE (DO/US)
(National Phase of International App.: PCT/DE00/02256, W/O 01/05190 A2)**

In re the
application of: **Hans-Dieter BOROWSKY**
International Application No.: **PCT/DE00/02256**
International Filing Date: **4 July 2000**
U.S. Serial No.: **Not Yet Assigned**
Filed: **Herewith**
For: **BEHIND THE EAR HEARING AID WITH
FRONT PLATE (amended)**
Attorney Docket No.: **HHI-035US**

BOX PCT
Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Preliminary to examination of the above-referenced patent application, please amend the enclosed above-titled International patent application as follows.

In the Specification:

Page 1, line 1, change the title to "**BEHIND THE EAR HEARING AID WITH FRONT PLATE**".

Page 1, line 2, after the title, insert the following "**Background of the Invention**".

Page 1, lines 3-4, please delete "according to the preamble of Claim 1".

Page 1, lines 15-16, please delete the phrase "according to the species".

Page 1, line 17, insert the following title: **"Summary of the Invention"**.

Page 1, lines 18-19, please delete this paragraph.

Page 3, line 1, insert the following title: **"Brief Description of the Drawings"**.

Page 3, line 10, please insert the following title: **"Description of Illustrated Embodiment"**.

In the Claims

Please amend claims 1-5 as follows:

1. (Amended) A behind the ear hearing aid, comprising a housing having a housing shell, an electronic circuit, a power storage unit, and a multi-function plate designed as a front plate and adapted to couple to the housing shell, wherein the multifunction plate includes an access opening for one of the power storage unit and the electronic circuit.
2. (Amended) The hearing aid according to claim 1, wherein the multifunction plate is adapted for use in an in-ear hearing aid and is constructed to match a contour of the housing shell.
3. (Amended) The hearing aid according to claim 1, wherein the front plate is matched to the contour of the housing shell in standard production.
4. (Amended) The hearing aid according to claim 1, wherein the housing shell and the front plate are joined in a detachable manner.

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5. (Amended) A front plate intended for use in an in-ear hearing aid in a behind-the-ear hearing aid, the front plate being modified such that said front plate matches a contour of a housing of the behind-the-ear hearing aid.

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REMARKS

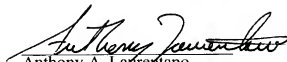
Applicants amend the specification to address minor formal matters, such as introducing appropriate section headers. Applicants also amend the claims to remove multiple dependencies, to provide proper antecedent basis, and to address other matters of form. The foregoing amendments introduce no new matter and are not related to issues of patentability.

Entry of the foregoing Preliminary Amendment is in order and requested.

If there are any questions regarding the proposed amendments to the application, we invite the Examiner to call Applicants' representative at the telephone number below.

Respectfully submitted,

LAHIVE & COCKFIELD, LLP



Anthony A. Ladreitano
Registration No. 38,220
Attorney for Applicants

28 State Street
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Date: 02 January 2002

Version With Markings To Show Changes MadeIn the Specification

Page 1, line 1, change the title as follows:

BEHIND THE EAR HEARING AID WITH FRONT PLATE~~HEARING AID~~
~~WORN BEHIND THE EAR, COMPRISING A FACE PLATE~~

Page 1, lines 3-4:

The invention relates to a hearing aid ~~according to the preamble of Claim 1.~~

Page 1, lines 15-16:

The goal of the invention is to improve a hearing aid ~~according to the species~~ so as to render it simple and inexpensive to manufacture.

In the Claims

Please amend claims 1-5 as follows.

1. A behind the ear hearing aid, comprising a housing having a housing shell, an electronic circuit, and a power storage unit, characterized in that the hearing aid (6) is constructed from a housing shell (1) and a multi-function plate designed as a front plate (4) and adapted to couple to the housing shell (1), in which wherein the multifunction plate includes the circuit or an access opening for one of the power storage unit and the electronic circuit is provided.
2. The hearing aid according to claim 1, ~~characterized by a commercially available mass-produced front plate (4) which is provided~~ wherein the multifunction plate is

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~~adapted~~ for use in an in-car hearing aid and ~~which is modified constructed so as to match~~
~~the a~~ contour of the housing shell (4).

3. The hearing aid according to claim 1, ~~characterized in that the multifunction plate~~
~~is formed of a wherein~~ the front plate (4) ~~which~~ is matched to the contour of the housing
shell (4) in standard production.

4. The hearing aid according to ~~one of claims 1 through 3~~ claim 1, ~~characterized in~~
~~that wherein~~ the housing shell (4) and ~~the~~ front plate (4) are joined in a detachable
manner.

5. ~~Use of a commercially available A~~ front plate (4) intended for use in an in-car
hearing aid in a behind-the-car hearing aid, the front plate (4) being modified such that
said front plate matches ~~the a~~ contour of ~~the a~~ housing of the behind-the-car hearing aid.

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BEHIND THE EAR HEARING AID WITH FRONT PLATE

The invention relates to a hearing aid according to the preamble of Claim

1.

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Hearing aids worn behind the ear, hereafter abbreviated as BTE-devices, are commonly constructed of two housing shells in which separating walls form multiple separate chambers within the interior of the housing. The installation process is relatively complex and expensive – both in terms of inserting the power storage unit which must be externally accessible to the user as well as the electronic circuit, microphone, and loudspeaker. Specifically, adapting this type of hearing aid to various technologies, i.e. to different functional characteristics of the electronic circuit, often requires a complicated replacement of the individual components within the hearing aid.

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The goal of the invention is to improve a hearing aid according to the species so as to render it simple and inexpensive to manufacture.

This goal of the invention is achieved by a hearing aid with the features of Claim 1.

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The invention proposes, in other words, using a so-called front plate, which is also designated as a “faceplate” and which is well known, for example, in connection with in-ear hearing aids. Such hearing aids were disclosed, for example, in DE 81 06 942 U1 or DE 297 23 569 U1, while Patent Abstracts of Japan, E-489 March 13, 1987 Vol. 11. No. 83, Custom Ear Fitting Type Hearing Aid” JP-61-238 198 (A) discloses a hearing aid with such a faceplate which is designed as a combination plate or multifunction plate. This plate not only forms the visible exterior housing surface of the in-ear hearing aid, but additionally all technical devices of the hearing aid are connected to it in such a way that this front plate is simply surrounded by a housing cover which is modeled by an appropriate impression method and adapted to the user’s ear.

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The use of an analogously designed multifunction front plate considerably simplifies the fabrication of a BTE device since only two modules need to be joined together, i.e. the housing shell and the front plate accommodating the technical components.

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- Particularly when there are small production runs for such BTE devices, a commercially available mass-produced front plate may be advantageously employed which is normally provided for use in in-ear hearing aids, although with larger dimensions than the dimensions normally required for use in BTE devices. This front plate may easily be mounted on top of the housing shell of the BTE device to be produced, the technical components being accommodated by the housing shell. Any remaining overhanging edges of the front plate, which is usually made of plastic and easily worked, are ground off.
- 10 In the event the BTE devices are to be produced in greater production runs, a suitable shape may be achieved in an especially economical manner from the start by mass-producing the front plate such that its contour is adapted to the housing shells. The manufacturer of the front plates simply modifies the injection mold for the plastic so as to match the contour of the front plate to the contour of the housing shell.
- 15 Insertion of devices into the front plate so modified may thus be accomplished by the manufacturer in precisely the same ways as with previous conventional front plates.

- An alternative approach is to reduce the dimensions of the initially larger front plate to the required contour matched to the housing shell immediately before the above-mentioned assembly stage. For example it may be advantageous in terms of inserting the electronic components to be able to pass the front plate in its previous larger dimensions through the automatic assembly machine. In this case, the front plate may be initially fabricated with the larger dimensions, fitted with the electronic components, and subsequently adapted in a cost-effective manner to the contour of the housing shell of a BTE device, for example, by using an automated punch or milling procedure. Excess material may then be removed before the front plate and housing shell are joined while retaining optimal accessibility of the front plate and without risking damage to the housing shell.
- 20
- 25

- 30 The housing shell and front plate may be advantageously joined in a detachable manner so that defective components may easily be replaced or they may be easily adapted to other desired technological properties of the hearing aid by completely replacing the front plate – with the result that in response to increasing miniaturization any manually performed operations on the hearing aid may be avoided and modules may be simply and quickly replaced.
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The following discussion presents an embodiment of the invention in more detail based on the drawings.

Figs. 1 through 3 show various views of a housing shell;

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Fig. 4 shows a commercially available front plate for in ear hearing aids; and

Figs. 5 and 6 show stages in the fabrication of a hearing aid according to the invention.

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Reference 1 in Fig. 1 identifies a housing shell, at the lower end of which housing shell 1 two projections 2 are indicated schematically. These may, for example, be: an on/off switch, a volume control, connector for a sound tube, or similar component.

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Fig. 2 shows housing shell 1 rotated 90° to show its narrow side.

Fig. 3 provides a view of housing shell 1 rotated a further 90° in which the trough-shaped interior 3 of housing shell 1 is visible, which interior serves to accommodate the technological components of the hearing aid.

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Fig. 4 shows a front plate 4 which in practice is called a "faceplate" and which, serving as a multifunction plate, has not only a housing or covering function in the hearing aid but also accommodates the technological components of the hearing aid.

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Visible from the outside is the covering plate of a battery compartment; located on the reverse side of front plate 4 relative to Fig. 4 are the electronic circuit, a loudspeaker, and a microphone if required. As understood within the concept "hearing aid" used in this application, the term microphone may optionally include not only sound-amplifying devices but also sound-generating devices such as tinnitus treatment devices which do not their own built-in microphones.

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Fig. 5 shows how front plate 4 is mounted on housing shell 1, the technological components being accommodated within trough-shaped interior 3. Protruding beyond the exterior contour of housing shell 1 are sections of front plate 4 which are subsequently removed by hand or by machine, e.g., ground away.

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- 4 -

Fig. 6 shows a hearing aid 6 after the excess sections of front plate 4 have been removed. It shows the exterior contour of housing shell 1, front plate 4 preferably being connected to housing shell 1 in a detachable manner, for example by a snap-on feature or possibly even a screw-based connection, such that in any case the removability of the "technical module" is realized in the form of front plate 4 and appropriate repairs or adjustments may be performed easily and quickly.

As a variation on the embodiment shown, a hearing aid 6 according to the invention may also be fabricated by first modifying the front plate to match the contour fitting the housing shell before the assembly stage in which the front plate is joined to housing shell 1. This may be achieved directly by matching the shape to the housing shell at the time the front plate is fabricated – with the result that no subsequent finishing, specifically no removal of excess areas of the front plate, is required, or this adaptation may be achieved by subsequent finishing before the front plate and housing shell are joined.

This type of modification may also include an arrangement of joining means on the front plate: for example, for screwing or clipping together, possibly also the generation of joining surfaces for adhesive bonding, ultrasonic welding, or the like, for joining the front plate to the housing shell.

Claims

1. A behind the ear hearing aid, comprising a housing having a housing shell, an electronic circuit and power storage unit, characterized in that the hearing aid
5 (6) is constructed from a housing shell (1) and a multi-function plate designed as a front plate (4) adapted to the housing shell (1), in which multifunction plate the circuit or access opening for the power storage unit is provided.
2. The hearing aid according to claim 1, characterized by a commercially
10 available mass-produced front plate (4) which is provided for use in an in-ear hearing aid and which is modified so as to match the contour of the housing shell (1).
3. The hearing aid according to claim 1, characterized in that the
15 multifunction plate is formed of a front plate (4) which is matched to the contour of the housing shell (1) in standard production.
4. The hearing aid according to one of claims 1 through 3, characterized in that the housing shell (1) and front plate (4) are joined in a detachable manner.
- 20 5. Use of a commercially available front plate (4) intended for use in an in-ear hearing aid in a behind-the-ear hearing aid, the front plate (4) being modified such that said front plate matches the contour of the housing of the behind-the-ear hearing aid.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
18. Januar 2001 (18.01.2001)

PCT

(10) Internationale Veröffentlichungsnummer
WO 01/05190 A2

(51) Internationale Patentklassifikation⁷: **H04R 25/00**

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(21) Internationales Aktenzeichen: PCT/DE00/02256

(22) Internationales Anmeldedatum:
4. Juli 2000 (04.07.2000)

(74) Anwalt: HABBEL & HABBEL; Am Kanonengraben 11,
D-48151 Münster (DE).

(25) Einreichungssprache: Deutsch

(81) Bestimmungsstaaten (*national*): CA, CN, JP, PL, TR, US.

(26) Veröffentlichungssprache: Deutsch

(84) Bestimmungsstaaten (*regional*): europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

(30) Angaben zur Priorität:
199 30 935.3 7. Juli 1999 (07.07.1999) DE
299 15 308.8 1. September 1999 (01.09.1999) DE

(71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US): AURIC HÖRSYSTEME GMBH & CO. KG
[DE/DE]; Osnabrucker Strasse 4-6, D-48429 Rheine (DE).

Veröffentlicht:

— Ohne internationalen Recherchenbericht und erneut zu veröffentlichen nach Erhalt des Berichts.

(72) Erfinder; und

(75) Erfinder/Anmelder (nur für US): BOROWSKY,

Zur Erklärung der Zweibuchstaben-Codes, und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(54) Title: HEARING-AID WORN BEHIND THE EAR, COMPRISING A FACE PLATE

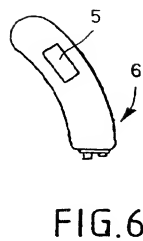
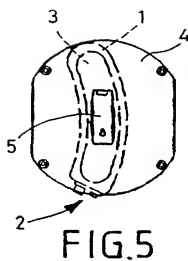
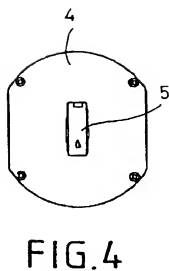
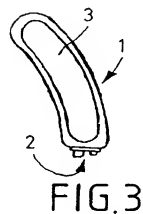
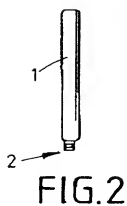
(54) Bezeichnung: HDO-HÖRGERÄT MIT FRONTPLATTE

(57) Abstract: The invention relates to a hearing-aid, worn behind the ear, comprising a housing which has a housing shell, an electronic circuit and an energy accumulator. The invention is characterised in that the hearing aid is constructed from the housing shell and a multi-functional plate, which is known as a face plate and which is adapted in form to the housing shell. The circuit and an access opening for the energy accumulator are provided on the face plate.

(57) Zusammenfassung: Bei einem hinter dem Ohr tragbaren Hörgerät, mit einem eine Gehäuseschale aufweisenden Gehäuse, und mit einer elektronischen Schaltung, sowie mit einem Energiespeicher schlägt die Erfindung vor, dass das Hörgerät aus der Gehäuseschale und einer an die Gehäuseschale angepassten, als Frontplatte bezeichneten Multifunktionsplatte aufgebaut ist, an welcher die Schaltung sowie eine Zugangsöffnung für den Energiespeicher vorgesehen ist.



WO 01/05190 A2



A66/24113 US

**DECLARATION, PETITION AND POWER OF ATTORNEY
 FOR PATENT APPLICATION**

(Check one):

- ☐ Declaration Submitted with Initial Filing
☒ Declaration Submitted after Initial Filing

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

BEHIND THE EAR HEARING AID WITH FRONT PLATE

the specification of which (check one):

- ☐ is attached hereto.
 OR
☒ was filed on **04 July 2000** as PCT International Application Number **PCT/DE00/02256** and was filed as **U.S. Serial No. 10/019,839**.
☐ and was amended by PCT Article 19 Amendment on _____
 (if applicable).
☐ and was amended by PCT Article 34 Amendment on _____
 (if applicable).

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

PRIORITY CLAIM

(Check one):

- ☐ no such applications have been filed.
- ☒ such applications have been filed as follows

1) FOREIGN PRIORITY CLAIM: I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (dd/mm/yyyy)	Priority Not Claimed	Certified Copy Attached	
				Yes	No
199 30 935.3	DE	07 July 1999 (07.07.1999)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
299 15 308.8	DE	1 September 1999 (01.09.1999)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- ☐ Additional foreign application numbers are listed on a supplemental priority sheet attached hereto.

2) PROVISIONAL PRIORITY CLAIM: I hereby claim the benefit under Title 35, United States Code §119(c) of any United States provisional application(s) listed below.

Provisional Application Number(s)	Filing Date (dd/mm/yyyy)

- ☐ Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.

3) U.S./PCT PRIORITY CLAIM: I hereby claim the benefit under Title 35, United States Code, §120 of any United States application or §365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Number	Parent Filing Date (dd/mm/yyyy)	Parent Patent Number (if applicable)

- ☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto.

POWER OF ATTORNEY:

As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

James E. Cockfield Reg. No. 19,162
 Thomas V. Smurzynski Reg. No. 24,798
 Ralph A. Loren Reg. No. 29,325
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 Jeanne M. DiGiorgio Reg. No. 41,710
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 Theodore R. West Reg. No. 47,202
 Shayne Y. Huff Reg. No. 44,784
 Hathaway P. Russell Reg. No. 46,488
 Daniel B. Ko Reg. No. 47,332
 John S. Curran Reg. No. P50,445

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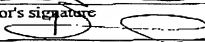
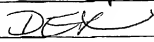
Anthony A. Laurentano, Lahive & Cockfield, LLP, 28 State Street, Boston, Massachusetts
 02109, United States of America

Direct Telephone Calls to: (name and telephone number)

Anthony A. Laurentano, (617) 227-7400

Wherefore I petition that letters patent be granted to me for the invention or discovery described and claimed in the attached specification and claims, and hereby subscribe my name to said specification and claims and to the foregoing declaration, power of attorney, and this petition.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor Hans-Dieter BOROWSKY	
Inventor's signature 	Date 15. April 200
Residence Agnes-Miegel-Strasse 11, D-48485 Neuenkirchen, GERMANY 	
Citizenship GERMANY	
Post Office Address (if different) (Same address as above)	